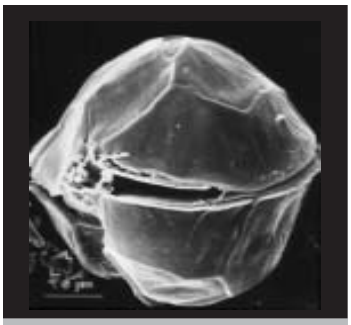
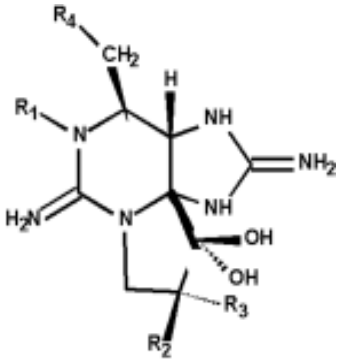


Alexandrium spp.

Species Distribution: A number of species of the dinoflagellate *Alexandrium* produce saxitoxin and related congeners. Although various species of *Alexandrium* have been reported in temperate oceans worldwide, potentially toxic species have been observed along the northeast and west coasts of North America and in the Canadian maritime provinces.

Toxins/Mode of Action:
Saxitoxin (STX) & Congeners



Chemical Structure of STX

The toxins responsible for paralytic shellfish poisoning consist of a suite of heterocyclic guanidines collectively called saxitoxins. Saxitoxin binds with voltage dependent sodium channel, inhibiting channel opening. The voltage dependent sodium channel plays a critical role in neurotransmission at both the neuronal synapses and neuromuscular junctions. The primary site of STX action in humans is most likely at the neuromuscular junction, thus inhibiting nerve conduction.

Human Health Syndrome: Paralytic Shellfish Poisoning (PSP)

Paralytic shellfish poisoning produces symptoms consumption of contaminated shellfish. In mild exposures, symptoms include tingling sensations or numbness, headaches, fever, rash, dizziness, and gastrointestinal illness. In severe cases symptoms include muscular paralysis, pronounced respiratory difficulty, and choking sensation. Despite the severity of this toxin victims begin to recover within 12-24 hours of intoxication. In some severe cases death may occur through paralysis and respiratory failure.

Species Associated With PSP:

- *Alexandrium caternella*
- *Alexandrium fundyense*
- *Alexandrium minutum*
- *Alexandrium tamarense*
- *Gymnodinium catenatum*
- *Pyrodinium bahamense* var. *compressum*

Syndrome Distribution: PSP was first confirmed in 1948 on the coast of Japan. In the 1960's and the early 1970's Japan continued to see outbreaks of PSP and new cases were confirmed in Malaysia, the Philippines, Indonesia, Australia, and North America. The United States has reported persistant problems with cases of PSP along both west and northeast coasts since the mid 1960's. In the early 1980's, various countries within Europe also began to report cases of PSP.